

## REMARKS

Claims 28 and 49 have been amended, and claims 2-4, 7-19, 22-33, and 45-49 are pending in the present application. The claim amendments are supported by the specification and claims of the application as originally filed, with no new matter being added. Accordingly, favorable reconsideration of the pending claims is respectfully requested.

### 1. Rejections Under 35 U.S.C. §112

Claim 28 has been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for the reasons stated on page 2 of the Office Action.

Claim 28 has been amended for clarity in light of the Examiner's comments. Accordingly, Applicants respectfully request that the rejection of claim 28 under 35 U.S.C. § 112, second paragraph, be withdrawn.

### 2. Rejections Under 35 U.S.C. § 103

Claims 7-11, 13-19, 22-33, and 45-49 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,869,385 to Tang et al. (hereafter "*Tang*") in combination with the article by Minegishi et al. (hereafter "*Minegishi*") for the reasons set forth on page 2 of the Office Action. Applicants respectfully traverse.

Independent claim 47 recites forming spacers in the masking substrate. There is no teaching or suggestion in *Tang* of formation of spacers in the patterned layer disclosed therein. While *Minegishi* teaches formation of a spacer (frame) in a selective oxidation process, there is no teaching or suggestion that such a spacer would be suitable for use in the process disclosed in *Tang*. It is an improper hindsight reconstruction to combine elements from two different prior

art references to achieve the claimed invention without any motivation for doing so other than Applicants' disclosure.

Independent claims 32 and 49 recite that silicon ions are implanted into the substrate. In contrast, *Minegishi* only discloses that boron ions are implanted for channel stopper after the framed mask fabrication step (page 56, col. 1). It is well known that boron ions are electrically conducting, whereas silicon ions are non-electrically conducting (*see Tang*, col. 6, lines 58-62). Further, claim 47 recites that the ions do not alter the electrical charge characteristics of the semiconductor material. Thus, there is no suggestion that the process of *Minegishi*, which uses boron ion implantation with a spacer, would be suitable in a method that uses silicon ion implantation or implantation of ions that do not alter the electrical charge characteristics of the semiconductor material. At the most, *Minegishi* suggests that a spacer could be used in the process of *Tang* when an implantation of electrically conducting impurity atoms such as boron is employed.

Accordingly, for the foregoing reasons, claims 7-11, 13-19, 22-33, and 45-49 would not have been obvious over *Tang* and *Minegishi*, and Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 103(a) be withdrawn.

Claims 2-4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Tang* in combination with *Minegishi* and further in view of Japanese Patent No. 5-175190 (hereafter JP '190) for the reasons set forth on page 3 of the Office Action. Applicants respectfully traverse.

Claims 2-4 depend from claim 47 and thus include the limitations thereof. As discussed above with respect to claim 47, there is no teaching or suggestion in *Tang* of formation of spacers in the patterned layer disclosed therein, and there is no motivation to combine the

teachings of *Minegishi* and *Tang*. In addition, there is no teaching or suggestion in JP '190 of the formation of spacers in the patterned film disclosed therein.

Accordingly, claims 2-4 would not have been obvious over *Tang* and *Minegishi* in view of JP '190, and Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 103(a) be withdrawn.

Claim 12 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Tang* in combination with *Minegishi* and further in view of Japanese Patent No. 62-48028 (hereafter JP '028) for the reasons set forth on page 3 of the Office Action. Applicants respectfully traverse.

Claim 12 depends indirectly from claim 47 and thus includes the limitations thereof. As discussed above with respect to claim 47, there is no teaching or suggestion in *Tang* of formation of spacers in the patterned layer disclosed therein, and there is no motivation to combine the teachings of *Minegishi* and *Tang*. In addition, there is no teaching or suggestion in JP '028 of the formation of spacers.

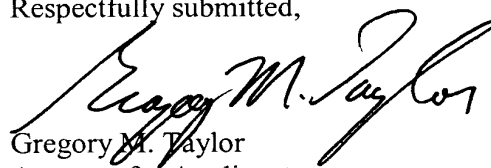
Accordingly, claim 12 would not have been obvious over *Tang* and *Minegishi* in view of JP '028, and Applicants respectfully request that the rejection of claim 12 under 35 U.S.C. § 103(a) be withdrawn.

### CONCLUSION

In view of the foregoing, Applicants respectfully request favorable reconsideration and allowance of the present claims. In the event there remains any impediment to allowance of the claims, which could be clarified in a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney.

Dated this 27<sup>th</sup> day of February 2003.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW THE CHANGES MADE

IN THE CLAIMS:

Claims 28 and 49 have been amended as follows:

28. (Thrice Amended) A method as recited in Claim 26, wherein said forming an opening in the hard mask comprises etching through the hard mask [and] upon the pad oxide layer.

49. (Once Amended) A method for forming an oxide region on a substrate assembly, the method comprising [the steps of]:

forming a hard mask over a volume of silicon of a substrate assembly;

forming an opening in the hard mask to expose a region of the volume of silicon;

forming a spacer around the opening in the hard mask, said spacer extending from the volume of silicon to contact the hard mask;

bombarding the exposed region of the volume of silicon with silicon ions through the opening in the hard mask so as to leave unaltered the conductivity type of the exposed region of the volume of silicon, wherein said bombarding implants silicon ions immediately adjacent to but not through the spacer around the opening in the hard mask; and

oxidizing the volume of silicon to form silicon dioxide by exposure through said opening of the exposed region to oxygen, wherein said bombarding and said oxidizing are performed through said opening having a width that is substantially the same at said bombarding as at said oxidizing, and wherein no additional layer is formed within said opening after said bombarding and prior to said oxidizing.